Review Article

A REVIEW ON HEALTH BENEFITS OF BRYONIA LACINIOSA SEEDS (SHIVLINGI): MYSTERIOUS ETHNOMEDICINE

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ABSTRACT:
Bryonia laciniosa Linn, also known as 'Shivlingi.' It belongs to the family Cucurbitaceae. This plant is mainly recognized for its seeds and is used in various ayurvedic drug formulations as an important ingredient. This review covers the morphological characters, actions and properties, ethnobotany**,** preliminary phytochemical analysis, chemical composition, general indications, safety profile, therapeutic uses and reported pharmacological activities of Shivlingi Seeds.
Key words: Bryonia laciniosa, Shivlingi, seeds.

INTRODUCTION:

India is one of the most biodiverse countries when it comes to medicinal plants. Over 2,500 plant species are known to have therapeutic benefits, while more than 6,000 are recognized for their herbal properties. Around the world, over 50,000 plants are used for medicinal purposes. Indigenous tribal communities in India hold a vast and deep knowledge of traditional remedies, relying on local plants to address everyday health needs. [1-3]

Today, it is well understood that the use of natural products as drugs has an advantage over synthetic drugs. Extracts of many plants, even in their crude state, have been found to have surprising effects on biological systems. Such effects are due to chemical elements present in plants, which are collectively termed the 'active principle'. Through systematic phytochemical studies of medicinal plants, many active components were isolated and characterized that are in broad use as highly potent medicines. [4]

Bryonia laciniosa Linn, also known as *Diplocyclos palmatus (Linn.)* Jeffrey and belonging to the Cucurbitaceae family, is commonly found across India and is referred to locally as 'Shivlingi.' The seeds of this plant are called 'Shivlingi' because the top surface of the seeds has markings and shapes that resemble the 'Shivling,' a sacred symbol of Lord Shiva, a widely worshipped Hindu deity.[5] The name "Bryonia" comes from the Greek word meaning "to sprout," reflecting the plant's strong ability to produce vigorous, herbaceous stems. [6]

In the Ayurvedic medical system, it is known as "Vrishya Rasayana". [7]

Shivlingi beej are applied to cure infertility in females. It is also used as uterine tonic to increase chances of getting pregnant in an infertile female. Shivlingi beej, just like Putra jeevak beej, is also utilized in Ayurveda to enhance the chances of conception. However, it has a specific ayurvedic property. The ayurvedic property upon which it reduces the Kapha dosha. And this is why the Shivlingi is more beneficial in case the patient shows evidence of heightened or amplified Kapha. However, if the Pitta Dosha of the patient has increased or worsened, then this is not suggested. [8]

Fig 1: *Bryonia Laciniosa* Plant

GEOGRAPHICAL DISTRIBUTION:

Shivlingi plants are found in several countries, including Nepal, South Korea, Pakistan, Thailand, the Philippines, China, Sri Lanka, Australia, tropical regions of Africa, Indonesia, Bhutan, and the Philippines. In India, they grow in a variety of states such as Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Rajasthan, Tamil Nadu, Tripura, and Uttar Pradesh. [9]

MORPHOLOGICAL CHARACTER:

Roots: Root are rather cylindrical and infrequently branched longitudinally, with short, thin, wiry lateral rootlets covering the entire surface of the root.

Rhizomes: Rhizomes are irregularly four-sided and flattened with two well-developed broad grooves, little thin and wiry lateral rootlets emerging from the whole surface, and a cluster of long roots at the base.

Stem: The stem of the plant is 1 to 1.5 meters long and has a diameter of 4 to 6 millimetres. It has a rough texture and prominent ridges. The stem is slender, smooth, and has deep grooves, with a strong, unpleasant smell. It also branches out extensively.

Leaves: Simple and alternate leaves of the plant are present. The lobes are oblong lanceolate, where the central lobe is the largest and most acute. The size is 10.2-12 x 3.5-4.5 cm in breadth and has a sinuate edge. The upper surface is rough, having many white spots. The lower surface is smooth and glabrous, reticulate, and five conspicuous veins come out from the base. It has a strong smell and taste.

Petiole: The petiole is 4 to 8.5 cm long, with an angular shape and deep grooves on one side. It has 5 to 6 small spines arranged in a row along its length.

Tendril: The tendril is split into two parts and grows from a node located in the angle between the leaf and its stem.

Male flowers: Male flowers have 3-6 small fascicles a filiform, glabrous peduncle, 5-20mm long.

Female flowers: The female flowers are few in number, grouped together, and found alone in the same axil. They have five petals that are fused together, sharp, covered in hair, and shaped like oval-oblong segments. The calyx is smooth, about 20-25 mm long, and has narrow, pointed teeth.

Corolla: 3 -5 mm length, segmented claps, obovate, tigitouslys velvety pubescent.

Seeds: The seeds are oblong in shape, resembling shivlings, and measure about 5-6 mm long. They are yellowish-brown with a sharp, pointed tip at one end. The middle of the seed is raised, and there's a noticeable ridge around its outer edge. The seeds have a distinct taste and smell.

Aril: pale green, bitter and very pulpy, with a bag-like coat covering the entire seed.

Fruit: a berry with seeds, with smooth skin covered in 5-6 longitudinally running streaks. Fruit green and then changes to crimson at maturity. [10-11]

TAXONOMIC CLASSIFICATION:

Domain	Eukaryota
Kingdom	Plantae
Subkingdom	Viridaeplantae
Phylum	Tracheophyta
Subphylum	Euphyllophytina
Infraphylum	Radiatopses
Class	Magnoliopsida
Subclass	Rosidae
Superorder	Violanae
Order	Cucurbitales
Family	Cucurbitaceae
Subfamily	Cucurbitoideae
Tribe	Benincaseae
Genus	*Bryonia*
Species	*laciniosa*
Botanical name	*Bryonia laciniosa* L. [12]

Table I: Taxonomic Classification

VERNACULAR NAMES:

Bengal	Shiva lingani
English	Indian bryony, Lollipop climber
Gujarat	Shivalingani
Hindi	Gargumaru, Ishwara lingi, shivalingi
Kannada	Linga tondeballi, Lingatonde balli, Lingatonde, Shivalinga
Malayalam	Neohmaka
Marathi	Shivlingi, Vaduballi
Nepal	Ghurmi iahara, Ghuru
Sanskrit	Pastambhini, Bakapushpha, Shiva Mallika
Siddha	Iyaveli, iyaviraali
Tamil	Iyaveli/Iyvirali
Telugu	Lingadanda [13]

Table II: Vernacular Names

AYURVEDIC PROPERTIES:

Rasa (Taste)	Katu (pungent), tikta (bitter)
Guna (Main quality)	Laghu (light), ruksha (dry), tikshna (sharp)
Virya (Potency)	Ushna (hot)
Vipaka (Resultant)	Katu (pungent)
Prabhava (Specific action)	Uterine tonic
Dosha Karma (Effect on Humors)	Pacifies Kapha Dosha and increases Pitta Dosha
Karma	Rasayana, Sidhma, Kushthahara
Organs effect	Uterus, ovaries and testes
Main indication	Infertility [14]

Table III: Ayurvedic Properties

ACTIONS AND PROPERTIES:

Kaphashamak: It helps balance an overactive Kapha dosha and clears blockages in the body by removing excess Kapha and toxins (Ama).
Pittavardhak: Pitta dosha is raised.
Vranshodhan: It is known for its ability to aid in the healing of wounds.
Shothahara: It has anti-inflammatory attributes.
Madhumeh: It is used to help manage diabetes and acts as a natural remedy to lower blood sugar levels.
Medahar: It is linked to an anti-obesity characteristic.
Swaskashara: It is used to help manage asthma.
Garbhdharan: The seeds from a plant are utilized to encourage conception.
Jwarghna: It helps to reduce fever.
Alpaartab: It controls the menstrual cycle and is employed to treat oligomenorrhea.
Kashtaartab: It is used to relieve pain during menstruation.
Vajjikaran: It has aphrodisiac properties.
Garbhashyashothahara: It is used to help with low sperm count. [14]

ETHNOBOTANY:

In tribal communities, plants play a significant role in both daily life and rituals, often being used for their healing properties. One such plant, known in India as 'Shivlingi' or 'Gargumaru,' is an annual climber with striking red flowers and is considered to have strong medicinal value.[15] In Indian tradition, its seeds are particularly valued for their ability to support women in their journey to motherhood. The tribes Gond and Bharia existing in the Patalkot Valley accord their respect to this plant. According to them, it is good for childless people as the seeds of the plant carry stimulating chemical that enhances sperm qualities and love for sexual activity. In addition, the plant acts as a tonic, boosting both physical and mental well-being while helping to maintain youthfulness as one ages. Traditional healers, known as "bhumkas," prepare herbal remedies using the plant and suggest them to those in need. Interestingly, in the town of Bhumkasin Harra-Ka-Chhar in Patalkot, it is believed that the seeds of this plant can help women conceive boys. In Gaildubba, traditional healers mix Shivlingi seeds with Tulsi leaves (*Ocimum basilicum*) and jaggery, that unrefined sugar commonly used in India, and they administer it to the woman who, according to Gaildubba, does not give her a baby. Shivlingi is one of the twin sisters; it can easily be recognized by its flower/nature/seed. Moreover, there is a notable fragrance of the plant. [16]

PHYTOCHEMISTRY:

The main active compound in the plant is a bitter substance called bryonin. It is also said to contain other compounds like glucomannan, goniothalamine, and punicic acid. [17-20]
Additionally, Shivlingi has rutin, quercetin, and isoquercetin in its composition. [21,22]

PRELIMINARY PHYTOCHEMICAL ANALYSIS:

Sr. No.	Name of the phytochemicals	Petroleum ether extract	Ethyl acetate extract	Chloroform extract	Methanol extract	Aqueous extract
1.	Alkaloids	Absent	Absent	**Present**	**Present**	**Present**
2.	Flavonoids	Absent	Absent	**Present**	**Present**	**Present**
3.	Tannins	**Present**	**Present**	**Present**	**Present**	Absent
4.	Saponins	Absent	Absent	Absent	**Present**	**Present**
5.	Proteins	Absent	Absent	Absent	**Present**	Absent
6.	Phenols	Absent	Absent	Absent	**Present**	Absent
7.	Steroids	Absent	Absent	**Present**	**Present**	**Present**
8.	Cardiac Glycosides	**Present**	**Present**	**Present**	**Present**	**Present**
9.	Di Terpenoids	Absent	Absent	**Present**	**Present**	Absent
10.	Tri Terpenoids	Absent	Absent	**Present**	**Present**	Absent [23]

Table IV: Phytochemical Analysis

The seeds had a low moisture content of 4.15%, which would be beneficial in further shelf-life extension. Seeds contain 14.43% protein and 29% oil.

There were appreciable quantities of minerals, reported by atomic absorption analysis in the full fat seed powder. Of these Ca^{++}, Mg^{++}, Na^{+}, Fe^{+++}, Zn^{++}, Cu^{++}, Ni^{++}, Co^{++}, and Pb^{++} are listed below K^{+}. By ultimate analysis carbon was present as the greatest percentage, hydrogen next, nitrogen then sulfur.

The seeds are rich in various types of fatty acids, including palmitic, stearic, and behenic acids (which make up 41.48% of the saturated fatty acids), as well as unsaturated fatty acids like oleic acid and nerveonic acid (19.23% of monounsaturated fatty acids). They also contain linoleic acid and omega fatty acids, such as alpha- and gamma-linolenic acids, which contribute to 33.9% of the polyunsaturated fatty acids. [24]

The seed oil contains a variety of compounds, including goniothalamin, glucomannan, anthraquinone, anthocyanins, coumarins, emodins, and serpentine. It also has fatty acids like oleic acid, hexanoic acid, and punicic acid, along with other chemicals such as 2-ethyl cyclo-hexanon, 1,2-benzenedicarboxylic acid, octadecanoic acid, sulfurous acid, and n-nonaldehyde. In addition, the oil contains acetic acid, 2H-pyran-2-one, 2(3H)-furanone, 3-octanoic acid, 9-octadecenoic acid, 2,4-decadienal, cyclohexanone, and octanoic acid. [25]

The highest percentage of palmitic acid is quantitatively present at 28.78%, followed by γ-Linolenic Acid at 17%, Linoleic Acid at 16.47%, Oleic Acid at 16.26%, Stearic Acid at 8.20%, Behenic Acid at 4.50%, Nervonic Acid at 2.97%, Lignoceric Acid at 1.04%, and α-Linolenic Acid at 0.52% as per the GC-FID analysis of the fatty acid composition of seed oil.

Palmitic acid makes up 20–30% of the phospholipids in our cell membranes, helping them function properly. It's also the most common saturated fatty acid found in the human body.

Gamma-linolenic acid (GLA) is known for helping with nerve pain related to diabetes, as well as managing conditions like high blood pressure, eczema, asthma, and arthritis.

Oleic acid is used to help reduce cholesterol levels and prevent heart disease.

Stearic acid plays a role in protecting the skin barrier and keeping the skin soft and smooth.

Behenic acid contributes to the smoothing effects found in moisturizers and hair conditioners.

Nervonic acid has a protective effect on the brain and helps regulate the function of brain cell membranes. [24]

GENERAL INDICATIONS FOR SHIVLINGI SEEDS:

Shivlingi seeds are typically recommended for adults in doses of 1-3 grams per time, with a maximum daily intake of 6 grams spread across multiple doses. For weight loss, it's suggested to take them twice a day with milk and once with warm water. The best time to take them is about three hours after eating a meal. For the best results, it's advised to use Shivlingi seeds for at least three months, though some individuals may need to take them for six months or longer depending on their health needs.

Safety Profile:

Shivlingi is relatively safe for most people when taken in the recommended dosage under professional supervision.

It is well-suited for those with Kapha Dosha aggravation and less so for those with elevated Pitta Dosha.

Shivlingi has no reported adverse effects when used appropriately according to Dosha and indications.

There are no known allergic reactions to Shivlingi seeds. It is generally considered safe for pregnant or breastfeeding women to use. Even in cases where it has been taken unknowingly during the first trimester for infertility treatment, there have been no reported side effects or harm to the foetus. There are no specific warnings against using Shivlingi seeds, and there is no known drug interactions associated with them. [26]

THERAPEUTIC USES

Infertility in women:

Diminished ovarian reserve (DOR) is a common cause of infertility in older women. Aartavakshaya, which is associated with DOR, is described as a deprivation or lack of Artava dosha, either not being on time, delayed, or scanty. According to the categories of Vandhyatva from Ayurveda, DOR can occur in any circumstances (congenital sterility). Shiva Mallika beej enhances fertility and facilitates conception. It also helps in regulating menstruation by women who have minimal discharge and little bleeding. Whereas Shivlingi is not to be taken by the ladies who have excessive bleeding during their periods. This research on Ayurvedic medicine finds its effectiveness more especially in the patients who are overweight or obese females with scant or deficient menstruation, feeling immensity in the inferior belly and engorgement or puffiness during the premenstrual and monthly menses. Shivlingi seeds can be especially helpful for women dealing with infertility, particularly if they're also experiencing symptoms of depression, such as emotional eating, fatigue, excessive sleep, discharge (leucorrhoea), and swelling in the limbs or body. It's also beneficial in cases of yeast infections. In these situations, Shivlingi should be used to its full potential. Its rejuvenating properties help enhance the production of the body's vital fluids, which in turn supports the formation of healthy reproductive elements needed for fertilization. Additionally, Shilingi's effects might support hormone balance, possibly through a compound like Dehydroepiandrosterone, which has androgenic properties. [27]

Impotence & Oligospermia:

The Shivlingi plant is commonly used in traditional medicine as a natural aphrodisiac and is believed to boost male fertility. It's thought to improve virility and increase testosterone levels, making it a popular remedy for impotence. The seeds of the Shivlingi plant also support sperm production, helping to improve sperm count. According to Ayurveda, Shivlingi seeds are particularly useful for treating conditions like impotence and low sperm count that are linked to an imbalance of Kapha Dosha. They help reduce excess Kapha and Ama in the body, which in turn clears blockages in various bodily channels. This process also increases the uptake of nutrients to the testes and the blood flow to the male reproductive organs, which enhances spermatogenesis progress and impotence treatment. [28]

Shivlingi has rasayan and vajikarana qualities that help synthesize the purest Shukradhatu that aids in fertilization. It can relax this condition by bringing out DHEA androgenic effects. Azoospermia is sperm deficit produced through interruption of spermatogenesis, which can be treated by therapies containing Katu Rasa, Ushna Veerya, and Rasayan effects that have decreased performance and induced spermatogenesis. [29]

Siddha Perspectives:

The Bryonia laciniosa plant, also known as Aivirali, Aiviral kovai, or Linga kovai, is widely used in Siddha medicine, particularly for its laxative properties. It can be helpful in treating conditions such as intestinal worms, eczema, pain, scabies, swelling, low sperm count, and female infertility. The dosage can vary depending on the individual's health needs. Typically, 4.2g to 8.4g of the powdered plant is used to make a decoction, or 1g to 2g of the powder can be mixed with sugar for consumption. When taken in larger amounts, it works as a laxative. Although the fruit has a bitter taste, it is often eaten as a vegetable and is also used in medicine to help reduce blood sugar levels. To treat dysentery, a seed extract is typically taken once a day for two to three days. Water mixed with the seeds is thought to promote conception. Traditional healers also use the leaves and seeds of this plant to treat fevers, and it's known to act as a tonic and help address impotence.

The leaf extract from this plant is also used to treat inflammation and as a cathartic. The seeds are used in treating the postpartum complaints, constipation, cholera, asthma, and diarrhoea besides improving female fertility. The entire plant can be used to treat jaundice. Three to five days 30 ml of the entire plant decoction is given twice a day. An infusion of the leaves is administered internally in treating rheumatism. In conception, more especially a male child, seeds are crushed in milk. The dosing period for a couple of weeks has been recommended using one cup. A mixture containing one tablespoon Sag powder (*Tectona grandis Linn*) and dried fruit powder with one teaspoon of it, administered orally thrice daily, cures urinary complaints. Its leaf paste is used for cure of rheumatism and joint pains. For increasing the sperm count, five hundred milligrams of mixture of one teaspoonful of powdered Shivlingi seeds and Ashwagandha root are taken twice a day after drinking cow's milk for six months. Two grams of the seeds of each of the above-mentioned two plants, that is, Shivlingi Putrada (*Diplocyclos palmatus*) and Ghanfodi Madkafodi (*Cardiospermum helicacabum L*), are crushed with one leaf of Piper betel and consumed thrice daily for three days to induce ovulation. [29]

REPORTED PHARMACOLOGICAL ACTIVITIES OF SHIVLINGI SEEDS:

Ulcerative colitis

Tripathi and Jain (2020) intended to test if an ethanolic extract of *Bryonia laciniosa* (EEBL) seeds may benefit rats with ulcerative colitis. In rats, EEBL was tested for its capacity to protect them from Dextran Sulphate Sodium (DSS)-induced colitis. Each group's disease activity index and moist colon weight were determined. MPO activity and antioxidant chemical levels were also assessed in the treatment groups. In rats given 200mg/kg and close to the normal prescription, DSS produced colitis, which dramatically elevated MPO activity, whereas EEBL therapy significantly decreased it.

When the DSS model group was compared to the MDA level in tissue, the results revealed that the intestinal MDA content was significantly reduced and was comparable to the conventional medicine. The effects of EEBL on antioxidant levels (SOD, CAT, and GSH) were investigated. The significant antioxidant activity of EEBL seeds was demonstrated when antioxidant parameters were restored to normal levels with an ethanolic extract of *Bryonia laciniosa* (EEBL) seeds. The ethanolic extract of *Bryonia laciniosa* seeds contained flavonoids and phenolic components that contributed significantly to antioxidant activity due to their free radical scavenging capacity. While testing in vivo antioxidant activity, extract-treated groups exhibited a considerable increase in GSH and a decrease in MDA levels. As a result, EEBL seeds' antioxidant and free radical scavenging characteristics may aid in the repair of ulcerative colitis. [30]

Antidiabetic

Patel et al. (2015) studied the effect of the ethanolic concentrate and saponin fraction of *Bryonia laciniosa* seeds on increased sugar levels, dyslipidaemia, and oxidative stress in neonatal streptozotocin (nSTZ)-induced diabetic rats. When diabetic rats were six weeks old, they were administered orally 250 and 500 mg/kg of ethanolic concentrate, 100 and 200 mg/kg of saponin component, and 3 mg/kg of the standard drug glibenclamide for ten weeks. The effects of the ethanolic concentrate and saponin fraction on several biochemical markers in diabetic rats were studied. Glucose, triglycerides, cholesterol, high density lipoprotein, low density lipoprotein, very low-density lipoprotein, serum creatinine, serum urea, aspartate transaminase, and alanine transaminase activities were all reduced after a 10-week ethanolic concentrate extract and saponin portion treatment. *Bryonia laciniosa's* antihyperglycemic activities were most likely related to an extra pancreatic mechanism, as evidenced by unchanged plasma insulin levels. *Bryonia laciniosa* reduced malondialdehyde, superoxide dismutase (SOD), glutathione (GSH), and catalase (CAT) activity in the liver. Diabetic rats were given ethanol extract and saponin fraction, which significantly improved their antioxidant levels. In treated nSTZ diabetic rats, SOD, CAT, and GSH levels increased significantly. Thus, *Bryonia laciniosa* seed extract and its saponin component were discovered to be useful in the treatment of nSTZ diabetic rats. [31]

Aphrodisiac

In a study conducted by Chauhan and Dixit in 2010, an alcoholic concentrate of *Bryonia laciniosa* Linn seeds was administered orally to a group of male albino rats for 28 days at doses of 50, 100, and 150 mg/kg body weight/day. The researchers investigated changes in sexual behaviour, histology of the testis and epididymis, reproductive organ epididymal sperm density, and androgenic hormone levels. The characteristics of sexual conduct examined, such as mount frequency, mount latency, intromission frequency, and intromission latency, were all significantly altered. Body weight increased significantly, as did the weight of the testis, seminal vesicle, prostate, and epididymis. Transverse testis slices in the epididymis demonstrated increased spermatogenesis and a significant increase in sperm count. Similarly, the fructose content of the seminal vesicle increased. The extract therapy dramatically enhanced serum testosterone and luteinizing hormone levels. The study clearly shows the extract's androgenic activity as well as its effects on the hypothalamic pituitary gonadal axis. [32]

Toxicity Studies:

Sivakumar and Perumal (2004) conducted short-term toxicity research on the methanolic extract of *Bryonia laciniosa* (MEBL) and discovered that when the extract was administered orally at doses of 125 and 500 mg/kg once a day for 14 days, there was no short-term toxicity. [33]

Sivakumar et al. (2005) found that administering the methanolic extract of *Bryonia laciniosa* (MEBL) at doses of 62.5, 125, and 250 mg/kg had no adverse effect on liver and kidney function in the extract-treated rats.

Mice given a dosage of 250 mg/kg or more had toxic symptoms such as lethargy, loss of appetite, delayed movement, disorientation, hair erection, and hypothermia. After 14 days of repeated daily doses of 62.5, 125, and 250 mg/kg, the mice's body weight remained unchanged. In comparison to normal mice, a higher dose of MEBL (250 mg/kg) was found to significantly influence enzyme levels such as SGPT (87.4U/I) and SGOT (48.3U/I). [34]

Reddy et al.'s 2010 study on acute toxicity found that no fatality occurred up to a dosage of 3gm/kg body weight. The extract's LD_{50} was greater than 3gm/kg when measured orally. As a result, at the dosage tested, the medicine was found to be safe. [35]

CONCLUSION:

According to the literature review, the Shivlingi herb has a significant medicinal value. It is regarded as an effective treatment for infertility. Specifically, the seeds of the plant are used for a variety of medical uses. However, nothing is known about the plant's phytochemical ingredients or medicinal potential. As a result, the plant requires more attention from researchers and scientists for additional experimental investigations and clinical study to determine its pharmacological qualities, which will aid in the development of key medicinal medications. It is proposed that additional research be conducted to extract, purify, and maybe describe the active ingredients responsible for the plant's activity. Before putting something into practice, it must be scientifically validated.

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This research did not involve human participants, animal subjects, or any material that requires ethical approval.

Informed Consent Statement

This study did not involve human participants, and therefore, informed consent was not required.

REFERENCES:

1. Kubde MS, Khadabadi SS, Farooqui IA, Deore SL. Lagenaria siceraria: Phytochemistry, pharmacognosy and pharmacological studies. Rep Opin. 2010;2(3):91-8.
2. Tijani AY, Uguru MO, Salawu OA. Anti-pyretic, anti-inflammatory and anti-diarrhoeal properties of Faidherbia albida in rats. African Journal of Biotechnology. 2008;7(6): 696- 700.
3. Srivastav S, Singh P, Mishra G, Jha KK, Khosa RL. Achyranthes aspera-An important medicinal plant: A review. J Nat Prod Plant Resour. 2011;1(1):1-4.
4. Pandey HS, Pandey RP, Singh BK (2016) Bryonia Laciniosa Linn. (Shivlingi) Seeds: A Hope for Diabetes and Impotency. Int J Recent Sci Res 7(7): 12553- 12554
5. Panda H. Handbook on herbal medicines. Asia Pacific Business Press Inc.; 2004.
6. Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol. III, 2nd. Edn., Lalit Mohan Basu, Allahabad, India. 1987.
7. Vijayashalini P, Anjanadevi N, Abirami P, Sharmila M. In Vitro Propagation of An Endangered Medicinal Plant Bryonia laciniosa L. Through Leaf Explant. Int. J. Curr. Res. Mod. Educ. 2017; 2:33-6.
8. Singh J. Shivlingi Beej (seeds). Ayur Times. 2017.
9. Gabrielian SE, Gevorgovich A. Bryonia, as novel plant adoptogen, for prevention and treatment of stress induced disorders. Promising Res Abstr. 1997; 5003:1-8.
10. Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol. III, 2nd. Edn., Lalit Mohan Basu, Allahabad, India. 1956:1023-28.

11. Hooker JD. The flora of british India. L. Reeve; 1885.
12. Ehsan B, Vital A, Bipinraj N. Antimicrobial activity of the ethanolic extract of Bryonopsis laciniosa leaf, stem, fruit and seed. African Journal of Biotechnology. 2009;8(15) 3565-3567.
13. Kaurav H, Choudhary S, Chaudhary G. Bryonia Laciniosa An Ayurvedic Herbal Plant 'Bryonia laciniosa'with its Ethnomedicinal Significance. Journal of Drug Delivery and Therapeutics. 2021 Jun 14;11(3-S):137-41.
14. Sharma PV. DravyaGuna Vijnana, Chaukhambha Bharti Academy. Varanasi India. IJCP. 2006; 1:162-6.
15. Sud K, Sud SJ. A scientific review on Shivlingi Beej (Bryonia laciniosa): a mystical ethno-medicine for infertility. European Journal of Biomedical. 2017;4(8):1098-2.
16. Singh V, Malviya T. A non-ionic glucomannan from the seeds of an indigenous medicinal plant: Bryonia laciniosa. Carbohydrate polymers. 2006 May 30;64(3):481-3.
17. Saxena N, Balyari N, Srivastva A. Pharmacological studies of novel pharmaceutical saponin molecules of seeds of Bryonia laciniosa. InIUPAC. Internationational conference on biodiversity, natural product chemistry and medicinal applications, New Delhi 2004 (pp. 26-31) 368.
18. Gowrikumar G, Mani VV, Rao TC, Kaimal TN, Lakshminarayana G. Diplocyclos palmatus L.: A new seed source of punicic acid. Lipids. 1981 Jul;16(7):558-9.
19. Mosaddik MA, Ekramul Haque M, Abdur Rashid M. Goniothalamin from Bryonopsis laciniosa linn (cucurbiataceae). Biochemical Systematics and Ecology. 2000;28(10):1039-40.
20. Singh V, Malviya T. A non-ionic glucomannan from the seeds of an indigenous medicinal plant: Bryonia lacinosa. Carbohydrate polymers. 2006 May 30;64(3):481-3.
21. Hage Konya SK, Yashpal M, Kumar P, Lal B. Characterization of the methanolic seed extract of two medicinal plants, Putranjiva roxburghii and Diplocyclos palmatus and its effects on gonads of Albino Mice. Journal of Bioresources. 2021 Jul;8(2):25-35.
22. Metri S, Dr. Singh R P, Dr. Shah M. Isolation and identification of Isoquercetin- A flavonoid from Bryonia laciniosa linn. International Journal of advanced research 2019 7(10),780-786
23. Parveen-Bano D, Singh N. Preliminary Phytochemical Investigation on Leaves, Seeds Extract of Diplocyclos palmatus (L.) C. Jeffrey Medicinal plant. Int. J. Adv. Res. 2015; 3:501
24. Patel P et al. Physico-chemical, Fatty Acid Profile and Mineral Nutrients of Diplocyclos palmatus (L.) C. Jeffery (Shivlingi) Seeds Neuroquantology, October 2022; Volume 20, Issue 12. Page 2153-2158
25. Kore Pratiksha Shyam, Hindole. S. S, Attar. M. S., Patane Pratiksha, Hoke Pallavi. "Unlocking the therapeutic potential: a review properties of Diplocyclos palmatus". International journal of novel research and development ISSN:2456-4184, Vol.9, Issue 4, Pp. G737-G745
26. Sharma PV. DravyaGuna Vijnana, Chaukhambha Bharti Academy. Varanasi India. IJCP. 1999; 2:168-9.
27. Chaudhari VM, Avlaskar AD. Role of Shivlingi in infertility. J Homeop Ayurv Med. 2013;2(141):2167-1206.
28. Chauhan M, Sharma V, Himanchal KD. A scientific review on shivlingi beej (Bryonopsis Laciniosa): amystrical ethno-medicine for infertility. IOSR J Appl Chem. 2018; 11:40-44.
29. Leelavathi D. Anti histamine, Anti-inflammatory, Anti-microbial activity of Aivaeli Samoola Chooranam and Navachara Chunnam for its Naturally Curing Polycyctic Ovarian Syndrome (Doctoral dissertation, Government Siddha Medical College, Chennai). 2013.13-16
30. Tripathi N, Jain AP. Preliminary pharmacological screening of L. for ulcerative colitis in Bryonia laciniosa rats. Adv. Pharm. J., 2020, 5(3), 113-118
31. Patel SB, Santani D, Patel V, Shah M. Anti-diabetic effects of ethanol extract of Bryonia laciniosa seeds and its saponins rich fraction in neonatally streptozotocin-induced diabetic rats. Pharmacognosy Research. 2015 Jan;7(1):92-99.
32. Chauhan NS, Dixit VK. Effects of Bryonia laciniosa seeds on sexual behaviour of male rats. International Journal of Impotence Research. 2010 May;22(3):190-5.
33. Sivakumar T, Perumal P, Sambath Kumar R, Vamsi ML, Gomathi P, Mazumder UK, Gupta M. Evaluation of analgesic, antipyretic activity and toxicity study of Bryonia laciniosa in mice and rats. The American journal of Chinese medicine. 2004;32(04):531-9.
34. Sivakumar T, Kumar RS, Perumal P, Vamsi ML, Sivakumar P, Kanagasabai R, Baskaran MV, Karki SS, Mazumder UK, Gupta M. Antitumor and antioxidant activities of Bryonia laciniosa against Ehrlich's Ascites Carcinoma bearing Swiss albino mice. Advances in Traditional Medicine. 2005;5(4):322-30.
35. Reddy J, Gnanasekaran D, Vijay D, Ranganathan TV. In vitro studies on anti-asthmatic, analgesic and anti-convulsant activities of the medicinal plant Bryonia laciniosa. Linn. International Journal of drug discovery. 2010;2(2):01-10.